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SCIENCE EDITION

The burning season

by Lisa Beutel

To date, in the Amazon basin in Brazil, there are three seasons, the wet, the dry, and one man-made—the burning season. The amount of forest area that disappears in flames each year has doubled since 1984. The fires, intended to clear land for planting and pastures, will destroy more than 200,000 square kilometres—an area larger than Denmark, Belgium, Austria and Switzerland combined.

Queimadas, or the burnings, fall between the dry and wet seasons when small farmers burn trees in order to clear land of scrub and jungle. This custom dates back to the Indians, but today the South Americans and white settlers have allowed the practice to get out of hand.

According to last year's Space Research statistics, four percent, or 207,000 square kilometres, of the forest in the Amazon region was burned between July and October. In the words of a Nasa scientist, it was "mind boggling, an unmitigated disaster." This burning, which launches tons of particles and carbon dioxide into the atmosphere, is now believed to account for at least one-tenth of the man-made production of CO₂, which is behind the warming of the Earth known as the Greenhouse effect.

These 5,000 fires a day not only cause damage to the air quality of the Western Hemisphere but also to everyday Brazilian life. Health problems to the surrounding population, shutting down of airports, air-traffic build-ups, and road and river accidents are a constant threat.

These environmentally catastrophic fires do not even fulfill their original purpose, namely, the creation of arable farmland. According to Prof. Rasmussen, of the McGill biology department, the soil that underlies the rainforest is inadequate to support any form of agriculture or grazing, the two main reasons for which the forests are burned. Prof. Rasmussen explains that the majority of the nutrients that support the forests are stored and recycled via the living organic matter. It is the forest itself which sustains, degrades and recycles the energy it needs to survive. The soil itself is of little importance. Once the trees and understory are gone the cycle is forever destroyed. Only the soil remains and the meagre amount of nutrient is "leached out in only a few years."

The infertile nature of the soil in all rainforests may seem odd when compared to the temperate forests to which we are all accustomed. In forests such as ours most of the nutrients do lie in the soil and the turnover rate of energy is only one-half that of the typical rainforest (10 times/year).

Brazil's policy of providing free land to homesteading settlers is a major contribution to the problem. Other factors are that the land is being "cleared" in order to make way for soybean plantations, to feed local sawmills and for cattle pastures. Privately, officials admit that low penalties and lax inspection have created an "anything goes" climate in the Amazons. Environmental laws are often ignored and after alerting authorities, the government is slow in reacting.

Forestry institute officials and federal police agents did, however, hold separate meetings last week to draw up new regulations and to discuss penalties for ranchers who set illegal fires. Hopefully new rules and a heightened awareness of ecology will offer the forest greater protection.



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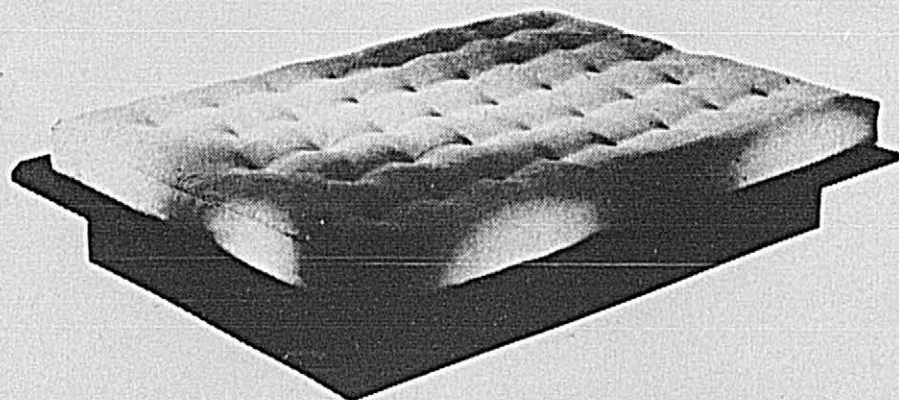
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Water works put on hold

By Rula Odeh

By 1990, every human being will have adequate supplies of clean water—or at least that was UNICEF's goal at the beginning of the decade. A wide variety of obstacles, however, has pushed back the deadline to the year 2000.

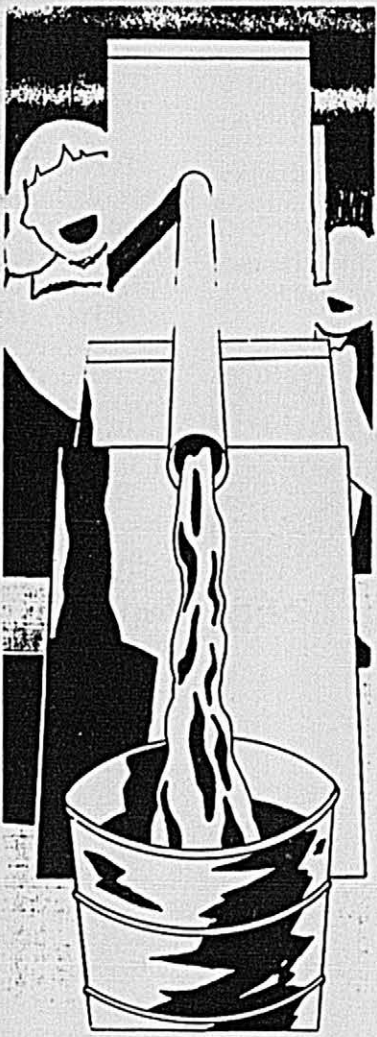
As of 1985, 1.2 billion people needed adequate water supply, while 1.7 billion needed appropriate sanitation, according to a report by the United Nations Children's Fund. But UNICEF's International Drinking Water Supply and Sanitation Decade has been making steady progress in seventy-six developing countries.

UNICEF's ultimate objective is to secure child health and well-being through improvements in the physical, biological and social environment of children and their communities. Each year an estimated 12.4 million children die from diseases that could be prevented with proper sanitation and improved water. Most deaths occur in before the age of five.

As a result of these conditions a wide variety of health problems can arise, including gastro-intestinal infections, skin and eye infections and parasites which drain limited food supplies and intensify malnutrition.

Improvements in water quality and availability have been shown to reduce diarrhoeal deaths by almost 40 per cent. The socio-economic benefits provided by water supply and sanitation have an even greater impact.

Accessible water supply means women and children no longer have to walk two to three hours per day in search of water. This saving of at least 600 calories (one third of the daily nutritional intake) directly benefits the health of the woman,



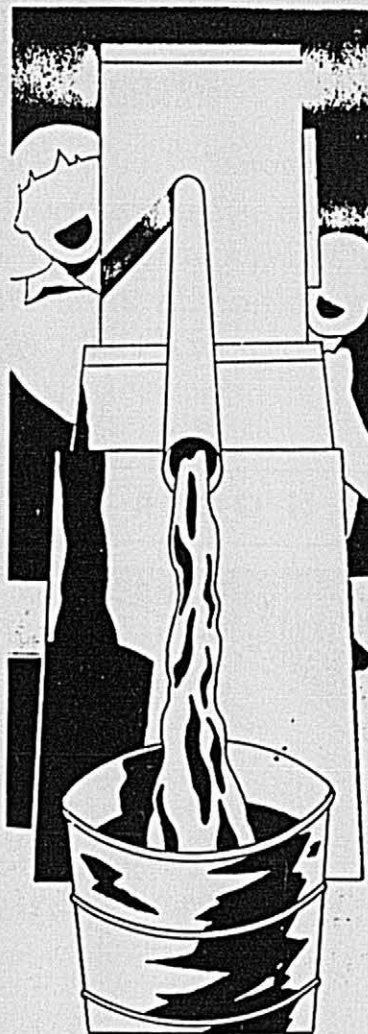
facilitates breast feeding and aids the development of her children. In addition, she has time for more productive activities and can begin to play a larger role in the development process.

Eventually, other basic community services can evolve from water and sanitation activities, including micro-irrigation (improving household food supplies), animal watering and promotion of commercial activity.

UNICEF's experience has shown that the best way to provide water is through low-cost, cost-effective technology that can be easily maintained or manufactured locally, according to Swedish geologist Martin Beyer, who was in Montréal last week.

An example of such technology is a UNICEF-Canada/CIDA joint project in Burundi, a mountainous country in central Africa. Spring water is relatively abundant, but the terrain makes water collection an arduous task for women and girls. Most springs are also open to contamination. UNICEF is helping to protect the springs by enclosing them in cement tanks, with piped systems to bring the water closer to people's homes. The total cost for this project is \$115 000.

A very popular hand-pump is the India Mark II, developed by Beyer. Each one is designed to serve 250 people. To date, one million new pumps have been installed in India, with 80 per cent in working order (compared to 30 per cent in the mid-seventies).



In 1980, funding requirements were estimated at a total of \$600 billion. However, more realistic approaches using such cost-effective methods as public standposts, hand pumps and latrines have been widely agreed

upon. Still a total amount of \$18 billion per year will be needed from 1990 onwards, an increase of \$8 billion, to complete all UNICEF's goals by the year 2000.

By co-operating with other UN agencies, UNICEF plans to provide community-based hygiene education, using face-to-face demonstrations by health workers and via local communication networks, with an emphasis on basic themes such as handwashing. "UNICEF tries to be aware of cultural sensitivities and plan accordingly," says Beyer. "The last thing we want to do is alienate the people we're trying to help."

UNICEF's efforts to improve the health and welfare of today's children will yield positive economic returns by strengthening the productive capacity of the developing countries. Unfortunately, lack of political and financial support coupled with natural disasters such as the recent floods in Bangladesh are enough to cripple the progress made so far and prevent relief for those who need it most—the children.

Oracle speaks... preserving circular hiccups

by Caitlin Huckell

The Oracle is desperately interested in your questions. Any 'why is', 'how does' or 'what is' that happens to hit you is welcome. Please come down to Union B-03 with any confusing, perplexing or amusing inquiries.

How do preservatives work?
—Jim Harris, U3 political science

Preservatives have become an essential part of most people's lives.

Preservatives work very simply. They are antioxidants which slow the absorption of oxygen into foodstuffs. The due date of any food is the time limit before all the antioxidant is used up. Once the antioxidant is exhausted, the normal bacterial and oxidation reactions will cause degradation of the food material.

What causes a completely round rainbow?
—Michael Hunt, U1 science

A round rainbow, technically called a halo, is an extremely rare natural phenomenon that occurs with specific atmospheric conditions. Just as the blue colour of the sky is caused by refracted short wave radiation, bending within the atmosphere and appearing within the blue section of the spectrum, rainbows result from atmospheric refraction.

On clear days which have extremely high clouds sitting at about 30 000 feet, short wave radiation entering the atmosphere is refracted off ice crystals and results in a complete circle of light shining within the visible spectrum. The high flat plane of clouds provides a complete surface of refraction and hence we can see the complete circle. Regular rainbows, which are due to refraction in raindrops, are low lying. We can see only half of their display as the ground cuts off the rest.

What causes a hiccup?
—Jane Ferstam, U2 anthropology

A hiccup is a natural reflex response. Although they are annoying, your body, with its infinite biological wisdom is merely trying to help you. An extremely small nerve of the diaphragm, the phrenex nerve, is irritated by a small bubble of air caught in the stomach.

Hiccups may have a fairly bland explanation, but the lengths to which people will go to cure themselves of that frustrating little reflex is amusingly limitless. We've all seen people holding their breath, attempting to drink upside down, or having people try to scare them, but you probably didn't realize that lobotomies used to be thought of as a means of curing a chronic hiccupper. This brilliant solution has been phased out of medicine today, still leaving no way to rid oneself of the tiny, uncontrollable annoyances.

Try sucking on a finger that has been dipped in granulated sugar. If it doesn't work, at least it tastes good. Actually, if you have someone block your ears while you drink something, it works. Trust me.

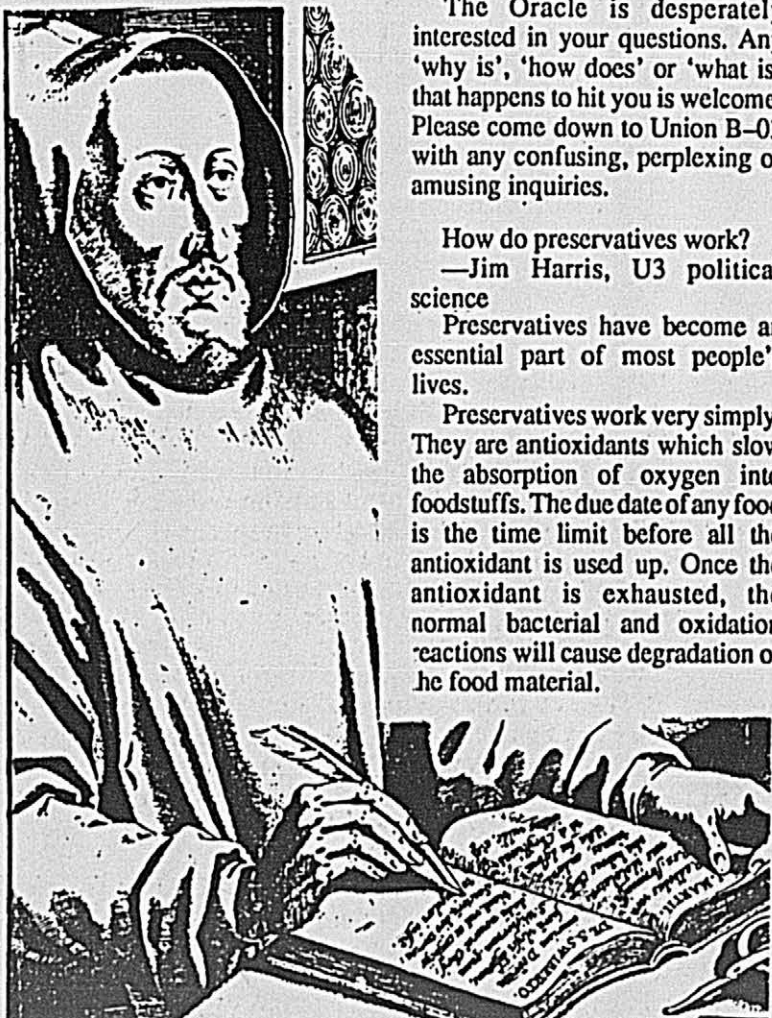
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LETTING THE SUN SHINE

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Our awareness of ozone depletion began in the late 1970s when scientists discovered that chlorofluorocarbons (CFCs) used in hair and deodorant sprays were destroying the ozone layer. Governments in North America and Europe severely restricted the sprays, hoping to be on the safe side.

But the safe side soon turned out to be not safe enough. While industry cut back production of CFC-based aerosols, it continued to find other uses for CFCs—in refrigeration, foam insulation and packaging, air

conditioners and solvents for cleaning electronic equipment. So instead of decreasing, CFC levels in the atmosphere have actually been increasing by five to six percent a year.

The Montréal Protocol

The most disturbing evidence of ozone depletion came in 1985, when scientists reported the appearance of an 'ozone hole' above the Antarctic. Springtime ozone levels above the South Pole were found to be fifty percent lower than usual. Further observations have revealed the hole is growing steadily, covering the entire continent and reaching populated areas of South America.

These observations soon prompted international action to combat ozone depletion. Last year, 24 nations signed the Montréal Protocol on Substances that Deplete the Ozone Layer. The treaty calls for a fifty percent reduction in CFCs by 1999.

Eleven countries, accounting for two-thirds of the global CFC consumption, must ratify the treaty by January 1, 1989. In addition, twenty countries must ratify a previous treaty, known as the Vienna Convention, before the Montréal Protocol can take effect. However, not all these countries have ratified the two treaties yet.

According to the U.S. Office of Technology Assessment, exemptions from the Montréal Protocol will mean CFC consumption will decrease by only thirty-five percent by 1999. For example, developing countries that depend on exports do not have to cut back on CFC production for ten years.

The Problem Gets Worse

Growing evidence suggests the Montréal Protocol will not go far enough. Last March, the Ozone Trends Panel, sponsored by the U.S. National Aeronautics and Space Administration, concluded that ozone depletion is worse than previously predicted. Scientists on the panel gave strong evidence suggesting CFCs have indeed been responsible for global ozone losses between two and five percent. (Ozone depletion increases with latitude and varies seasonally.)

Some say the rate of ozone depletion may even double as a result of the appearance of yet another ozone hole—this one over the North Pole. Both the Arctic and the more severe Antarctic ozone holes pose a serious environmental threat to the delicate polar ecosystems.

Industry Responds

Organizations such as Friends of the Earth, Pollution Probe and the U.S. Environmental Protection Agency (EPA) have reacted to these disturbing observations by calling for an immediate 85 percent reduction in CFC production and a complete reduction by the end of the century. Some have also called for an emergency meeting to toughen the Montréal Protocol.

Several companies seem to be answering the call for immediate action. Du Pont, the largest producer of CFCs, announced in March a 95 percent phase out in CFC production by 2003. Provigo, Québec's largest grocery chain, announced in February it would replace egg cartons containing CFCs with cardboard cartons. And last year, McDonald's announced it would stop using CFC-based packaging.

The chemical industry has also launched a major effort to develop safe

substitutes for conventional CFCs. A consortium of at least thirteen companies will spend the next five years testing the toxicity of potential substitutes.

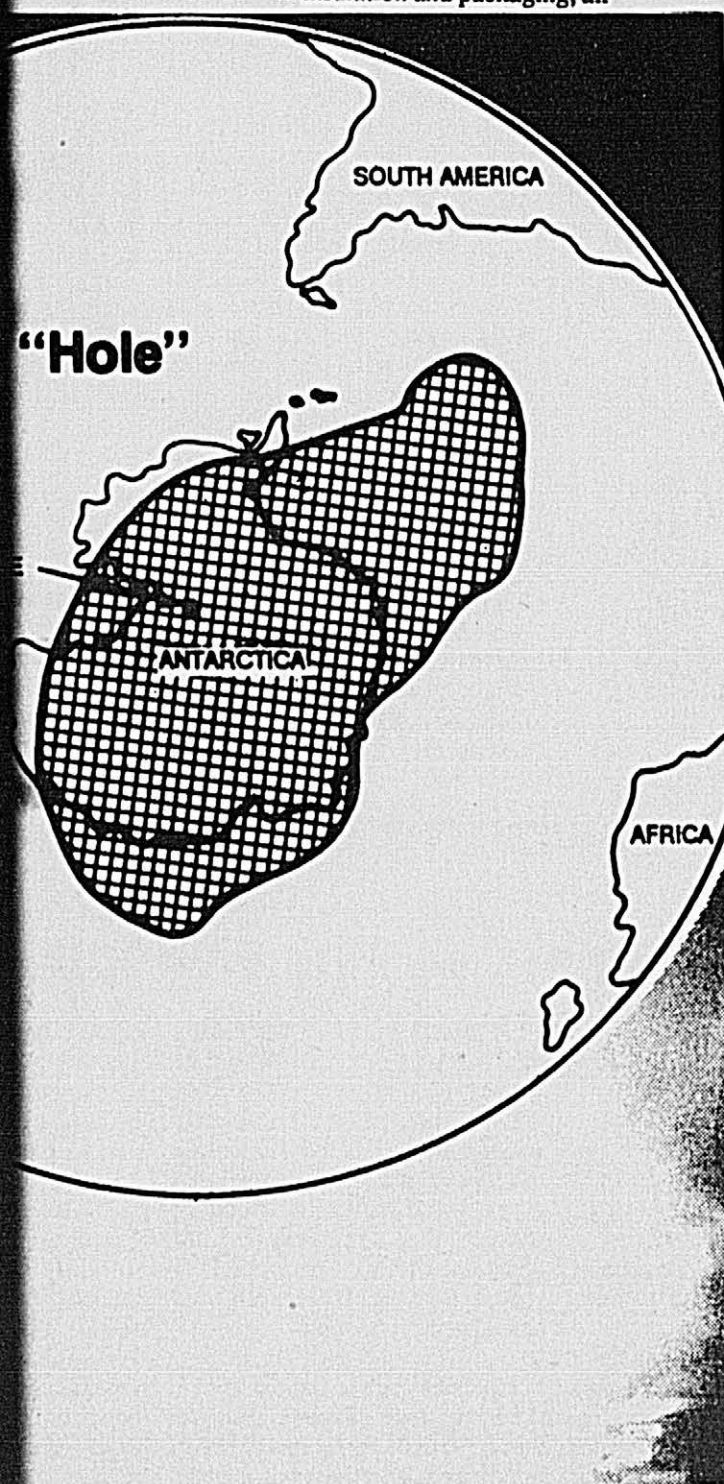
Some of these substitutes have already been rejected because they are either too flammable or toxic. However, one substitute, HCFC-22, is currently being marketed as an aerosol by several British companies, despite Imperial Chemical Industries' refusal to do the same. ICI claims that HCFC-22

may cause birth defects and should not be used as an aerosol.

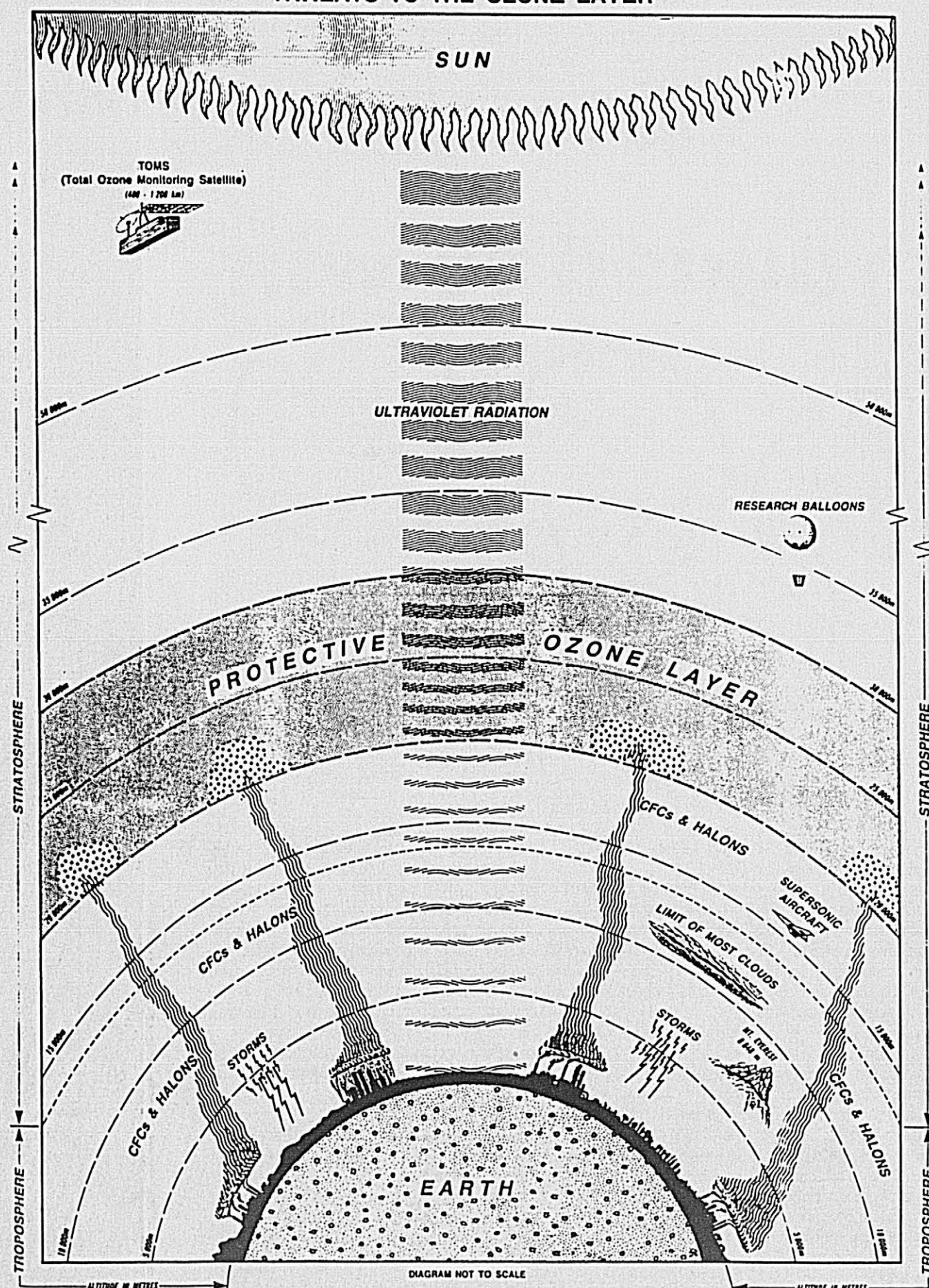
While companies argue over the safety of HCFC-22, other problems exist. Several substitutes, including HCFC-22, would require major redesign of refrigerators and air conditioners because they need to be stored at higher pressures. Some substitutes are also several times more expensive than conventional CFCs.

Another alternative is the reclamation and recycling of existing

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LETTING THE S

Where has all the ozone gone? That may well be the question of the twenty-first century. Despite our best efforts, we've been losing our protective shield against the sun's deadly ultraviolet light—our solutions just don't seem to keep up with the problem.

BY DAN HOGAN

Our awareness of ozone depletion began in the late 1970s when scientists discovered that chlorofluorocarbons (CFCs) used in hair and deodorant sprays were destroying the ozone layer. Governments in North America and Europe severely restricted the sprays, hoping to be on the safe side.

But the safe side soon turned out to be not safe enough. While industry cut back production of CFC-based aerosols, it continued to find other uses for CFCs—in refrigeration, foam insulation and packaging, air

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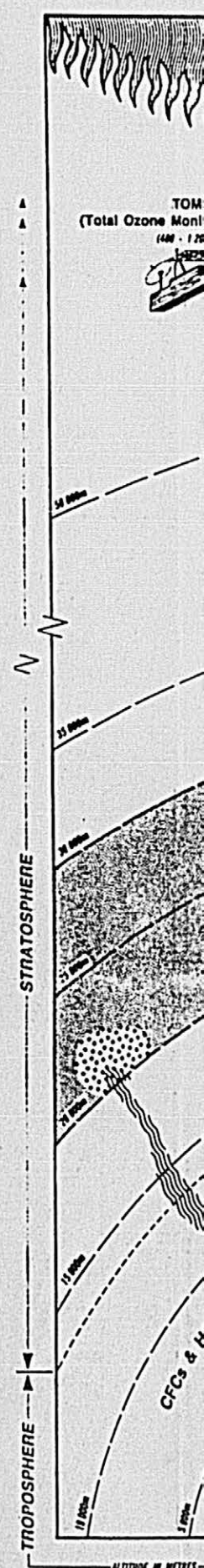
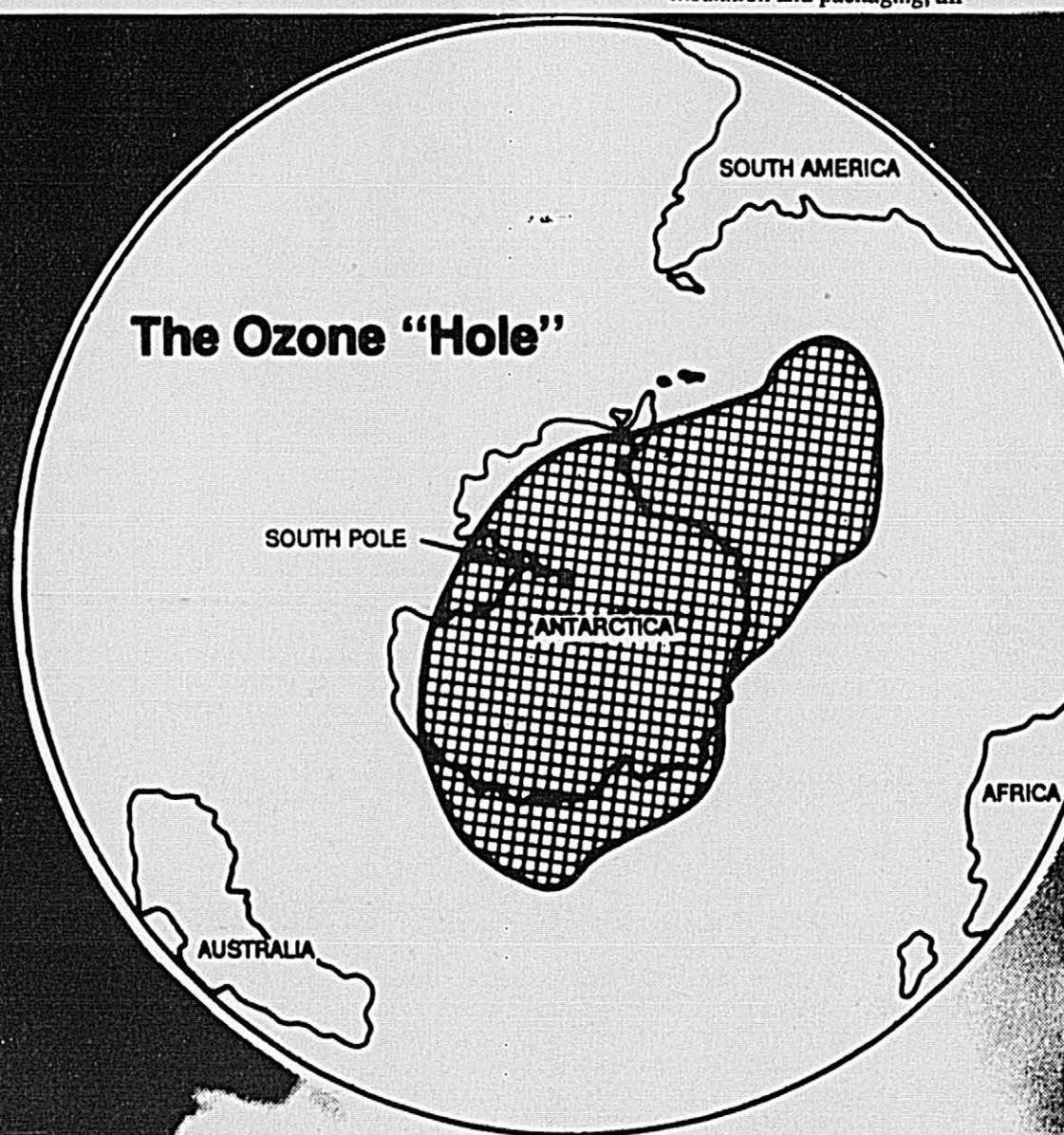
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Another alternative is the reclamation and recycling of existing

CFCs. Instead of blowing off CFCs contained in old refrigerators to be scrapped, devices could collect the CFCs. However, the equipment for draining off CFCs is expensive—from \$2000 to \$5000 per unit. That might be too expensive for the average refrigerator repair shop, but most CFC discharges occur in industries where there are much larger refrigeration systems. These industries may find it cost effective to cut back on CFC consumption through recycling.

ground-level ultraviolet light.

However, despite the recent loss of stratospheric ozone worldwide, U.S. scientists have found ultraviolet levels near the ground have actually decreased from 1974 to 1985.

One explanation is that pollution, clouds and airborne particles are blocking the ultraviolet light. Another is that ultraviolet penetration decreases during the winter when ozone depletion is at a maximum and the angle of the sun is at a minimum.

Despite these factors, decreasing ozone levels will eventually let more ultraviolet light through as the millions of tonnes of CFCs already pumped into the air make their way up to the stratosphere.

In the meantime, cutting back CFCs may cost the U.S. billions of dollars over the next 100 years. However, the EPA estimates not having any controls could cost the U.S. trillions of dollars in treating ultraviolet induced cancers.

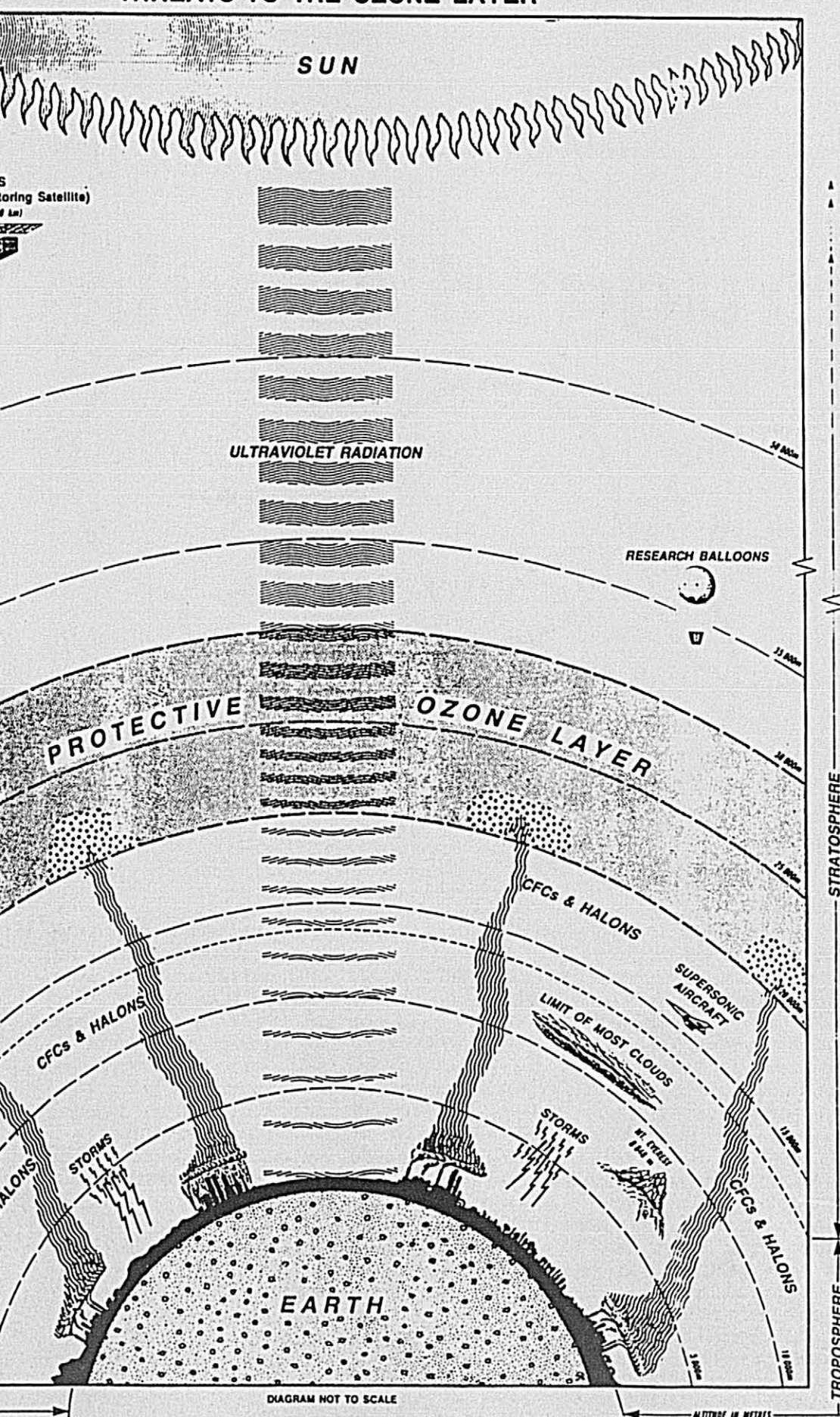
The depletion of the ozone layer is just one of the worsening environmental crises facing the world. It underscores the fact that global problems need global solutions.

The Hard Facts

But even with massive cutbacks in CFC production and consumption, atmospheric levels will continue to rise because of the long time CFCs stay in the atmosphere. The U.S. Environmental Defense Fund estimates that even with controls, ozone depletion won't level off until the middle of the next century when it reaches 10 percent.

But because a one percent decrease in ozone lets two percent more ultraviolet light through, at mid-century we could be basking in 20 percent more

THREATS TO THE OZONE LAYER



Ozone and its enemies

What does ozone do near the ground?

Ozone is a sweet, pungent gas with a bluish tinge, composed of three oxygen molecules. It can be created by electrical sparks during lightning storms, in subway stations or at bumper car rides at amusement parks.

It can also be created by the reaction of hydrocarbons found in gasoline fumes and nitrogen oxides from automobile exhaust. In urban areas, ozone is a major component of smog, contributing to the gradual warming of the Earth, commonly known as the 'greenhouse effect'.

Ozone is also poisonous. It can cause respiratory problems in humans and damage crops by attacking cell membranes. It can also worsen the effects of acid rain on certain plants.

West German scientists have recently shown that ozone levels near the ground have doubled in the last 100 years. These levels could rise unless emissions of hydrocarbons and nitrogen oxides are significantly reduced.

What does ozone do in the upper atmosphere?

About 90 percent of the Earth's ozone is found naturally in a layer 14 to 35 kilometres above the Earth's surface in the stratosphere. This ozone layer protects life from the sun's deadly ultraviolet rays by absorbing the rays with would otherwise cause skin cancer, cataracts and damage to the immune system. These rays can do extensive damage to plant life as well.

Normally, ozone molecules are

broken down by the ultraviolet light they absorb. This light can also break apart oxygen molecules into highly reactive oxygen atoms. These atoms can then attach themselves to oxygen molecules to produce ozone. As a result, stratospheric ozone levels are kept constant.

Ozone can also be destroyed by halogens such as chlorine, found in many CFCs, and bromine. A single chlorine molecule can destroy thousands of ozone molecules. Halons containing bromine can destroy even more ozone.

What do CFCs and halons do?

Invented in the 1930s by Du Pont and General Motors, CFCs were thought to be perfect chemicals. Because many of them are stable at ground levels and are not flammable, corrosive or toxic, they have been widely used in foam blowing, aerosols, refrigeration and cleaning solvents. Halons have been used mostly in fire extinguishers.

As a result of their stability, CFCs and halons can stay in the atmosphere for 75 to 130 years. After 7 to 10 years, these chemicals rise up to the stratosphere, where their chlorine and bromine atoms are liberated by ultraviolet light, leading to ozone destruction.

CFCs are also greenhouse gases. While carbon dioxide is the major cause of global warming, one CFC molecule warms the Earth 10 000 times more effectively than a carbon dioxide molecule. As of now, more than 15 percent of the greenhouse effect is due to CFCs.

La bioéthique

La bioéthique...C'est quoi?

Natalie Benoit

Avant tout, la bioéthique, ça concerne tout le monde. Non, ce n'est pas un nouveau domaine scientifique extrêmement complexe. Au contraire, c'est plutôt un phénomène social, un genre de prise de conscience. En fait, je pourrais définir la bioéthique comme étant la recherche d'une marche à suivre face aux nouvelles technologies que le monde scientifique nous fait découvrir. L'éthique (la morale) ne date pas d'aujourd'hui; on peut remonter jusqu'à Aristote afin de retracer les premières études philosophiques de la morale. Cependant, les bébés-éprouvettes et les pluies acides n'existaient pas 1000 ans avant Jésus Christ...

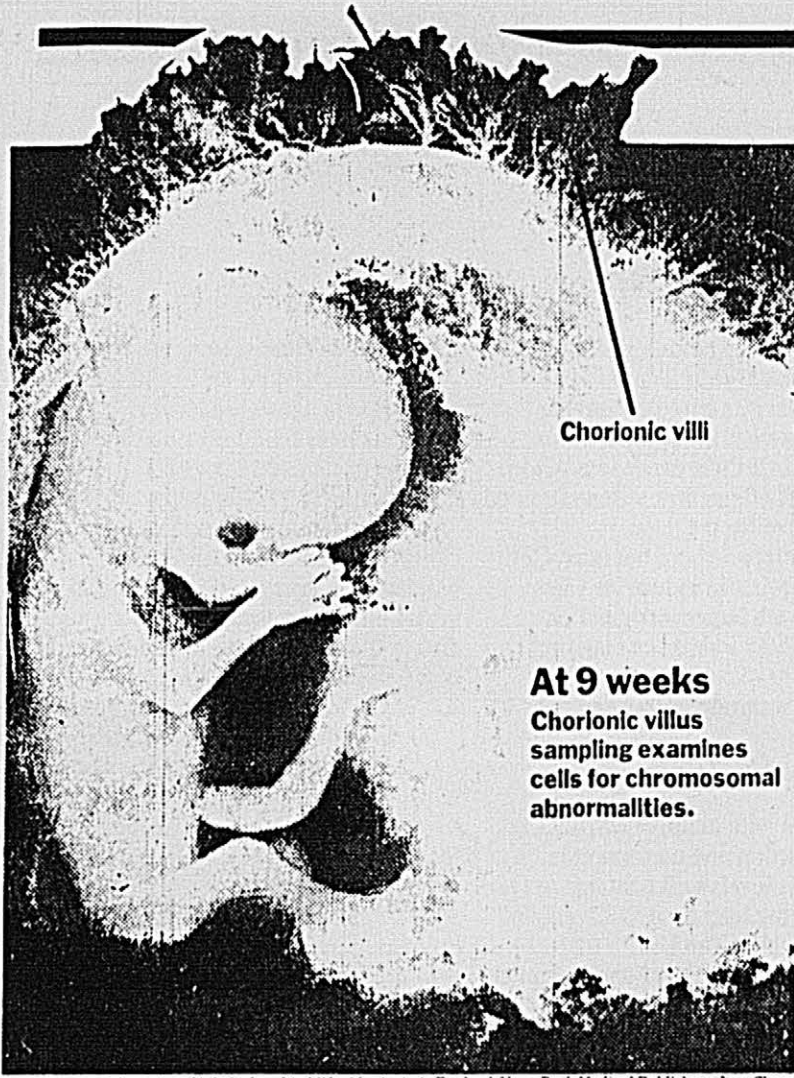
D'ailleurs, d'après Jacques Dufresnes, journaliste scientifique

québécois, l'état actuel de la science dépasse largement la compréhension des gens. Quand on pense qu'en Inde on vend des placentas pour en faire des cosmétiques ou que, plus près de nous, aux États-Unis, il y aurait un marché noir d'organes, ça porte à réfléchir.

Il nous faut donc reprendre et reviser les théories morales avancées par plusieurs philosophes au cours des siècles et tenter de les appliquer à notre monde; ce n'est pas évident. D'ailleurs, un jour ou l'autre, vous aurez à prendre une décision portant sur la bioéthique. Que ce soit sur l'avortement, les mères porteuses, l'effet de serre ou les BPC, cette décision ne sera pas facile à prendre. En fait, plusieurs facteurs vous influenceront: vous même, la société, l'avenir de cette société et si l'on y ajoute la politique et l'économie, on s'y perd littéralement.

Il faudrait peut-être s'arrêter un instant et réfléchir aux conséquences de ces nouveaux phénomènes. Devrions-nous arrêter momentanément la recherche? Ou bien devrions-nous essayer de rattraper cette dernière? Les scientifiques savent-ils (elles) ce qu'ils font? Faut-il leur confier notre avenir? Ne devrait-on pas mieux informer la population avant de l'assaillir avec de nouveaux concepts?

Je pourrais continuer avec ce genre de questions et d'exemples jusqu'à la fin des temps, mais je crois que vous avez saisi le problème. De plus, les décisions en bioéthique ne peuvent être prises par une seule personne; ce sont des enjeux sociaux importants, auxquels il faut faire face immédiatement, car plus on attend, plus les retombées seront sérieuses.



From "Color Atlas of Life Before Birth" by Marjorie A. England, Year Book Medical Publishers, Inc., Chicago

Athletes get drugged to win

by Tara Patel

This year's Olympic athletes are going to be the most heavily screened for drugs in the history of athletic competition. For those playing the risky game of sports and performance aid drugs, getting through Seoul's lab analysis may be the greatest challenge of the games.

It has traditionally been thought that 70 percent of an athlete's ability comes purely from genetic makeup, the rest by blood, sweat and tears. But today pharmacological methods to artificially enhance performance offer a new, though illegal option.

The performance aid drugs can be classified into three main categories: anabolic steroids, stimulants and depressants.

Anabolic steroids are derivatives of the natural male hormone testosterone. 'Anabolic' means tissue building.

They have been available to physicians since World War II when they were experimentally administered to increase aggressiveness in German troops. A significant portion of American users obtain anabolic steroids from their physicians. In 1979, 70 percent of all high ranking athletes in France admitted to using anabolic steroids.

If an individual is in good physical condition, well nourished and accustomed to intense training, anabolic steroid usage increases muscle mass and power, as well as the oxygen carrying capacity of blood in both women and men.

The longterm effects of anabolic steroid usage are unclear, but increased risk of cardiovascular disease has been suggested, and the development of liver and kidney tumors has been observed.

Anabolic steroids also have devastating side effects. In men these are a decreased sperm count, diminished libido and a reduction in the size and firmness of the testes. Some men develop gynecomastia, the growth of breast tissue under the nipples. Heightened aggressiveness is also very common.

The side effects in women include growth of facial hair, increased body hair, a deepening of the voice and an enlargement of the clitoris. All of these appear to be permanent. Reversible effects include the cessation or irregularity of menstruation, increased libido, aggressiveness and acne.

Human Growth Hormone (HGH), another hormonally derived drug, has become popular in recent years for improving muscle strength. Since a practical test for HGH detection has not yet been developed, it is often used instead of anabolic steroids before competitions where drug testing is done.

Long term usage of HGH causes acromegaly (growth of the face) in adults. Bones and connective tissue thicken to the point where shoes and rings cannot be worn. The brow, jaw and soft tissues overgrow causing grotesque facial features. The heart and lungs may double in size, and diabetes may develop.

While hormonally derived performance aid drugs strengthen athletes, they do nothing to combat the body's natural tendency to fatigue during intense effort. Amphetamines are one type of stimulant used by athletes to alleviate fatigue. These increase the athlete's alertness, self confidence and motivation during training.

Because amphetamines help athletes combat their natural need

for sleep, the body's natural barrier against overexertion is torn down. This causes dangerous secondary effects.

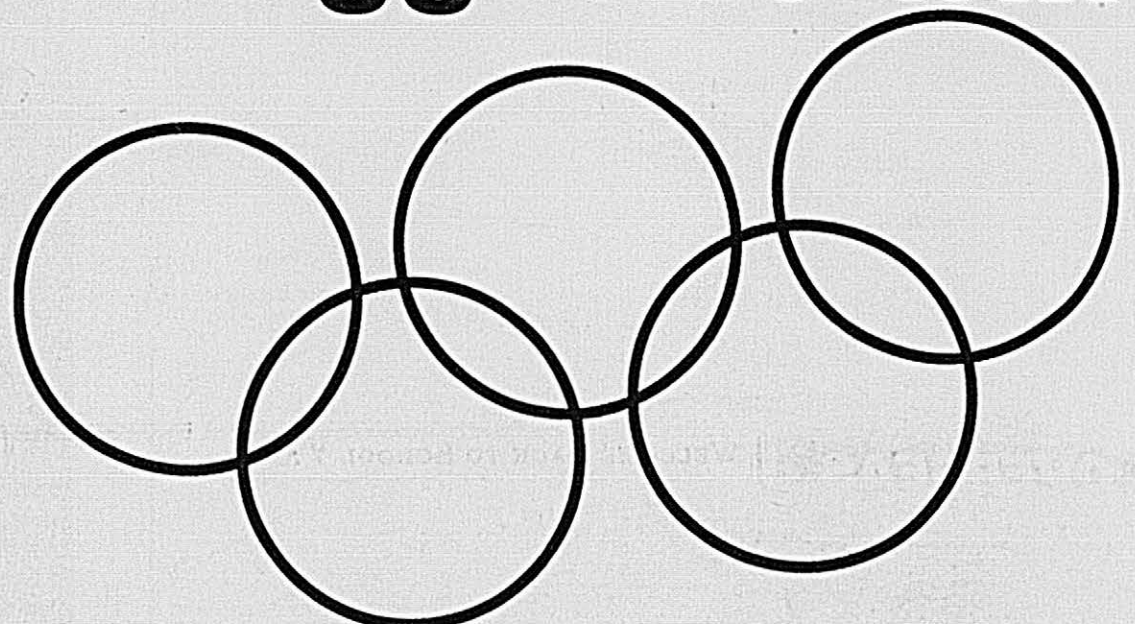
During the 1967 Tour de France, millions of viewers watched in horror as Tom Simpson collapsed. The autopsy linked the young cyclist's massive cardiac arrest to amphetamine usage.

Adverse effects of amphetamines on the central nervous system include tremulousness, anxiety, insomnia, fever, confusion and a toxic psychosis masked by delusions and paranoia. Death is caused by cerebrovascular hemorrhage, acute cardiac failure and hypothermia.

In the 1988 Olympic games, not only are hormonal and stimulatory performance aid drugs banned, but so are certain depressants such as beta adrenergic blockers. These are

used by some athletes participating in events such as archery, rifle and pistol shooting who have trouble dealing with anxiety. Beta adrenergic blockers slow the heart and decrease energy production. Respiratory problems, central nervous system disturbances and cardiovascular effects, including heart failure, have been well documented. Impotence has also been observed in males taking these drugs.

As competition stiffens and records are broken, athletes may feel pressured by coaches, team mates and their own quest for excellence. The Olympic motto is "Higher, faster, stronger", but the Olympic dream may not be worth the dangers posed by performance aid drugs.



Ads may be placed through the Daily business office, room B-17, Union Building, 9h00 - 15h00. Deadline is 14h00 two weekdays prior to date of publication.

McGill students: \$3.00 per day; \$7.00 for 3 consecutive days. McGill Faculty and Staff: \$4.00 per day; \$2.00 per day for more than 3 consecutive days. All others: \$4.50 per day. There is a 25 word limit. There will be a charge of 25¢ for each word over the limit. Boxed ads are available at \$4.00 per ad per day - no discounts on boxing. **EXACT CHANGE ONLY PLEASE.**

The Daily assumes no financial responsibility for errors, or damage due to errors. Ad will re-appear free of charge upon request if information is incorrect due to our error. The Daily reserves the right not to print any classified ad.

341 - APTS., ROOMS, HOUSING

3 1/2 to Sublet, downtown. Included: fridge, stove, locker, wall to wall carpet, indoor parking. Sherbrooke & St. Mathieu, near Guy metro. (10 minute walk from McGill) \$435/mo. Call Caroline from 9:30 to 5:00 at 398-6790/6791. After 5:00 pm at 933-0078.

To Share: completely furnished 4 1/2 \$200 includes heating and hot water. Near Metro. Preferably female non-smoker. Ann-Marie 647-1189 or 653-3298.

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350 - JOBS

Part-time sales job available. Large advertising company has 3 openings for "money hungry" students. Will provide training. Benefits include, cash bonuses, car. Maria: 3121.

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Bilingual professional services. Resumes, cover letters, translation, editing, typing (theses) etc. (Special student rates). Typing courses. Reasonable rates. 342-8197.

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Word processing. Desktop publishing, term papers, thesis on laser printer. Bursary loan forms, rush jobs. Inquire about club membership. Near University 861-6767 anytime.

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Willing Females and males needed for student haircuts. Supervised by professionals. Tuesdays 6 p.m. for cuts \$10, 5 p.m. for technical work. \$12 tints only, \$18 perms + highlights. Estetica 2175 Crescent. For appointments 849-9231.

361 - ARTICLES FOR SALE

Rugby shirts, T-shirts, boxer shorts, sweats, coveralls, caps, etc. Team uniforms (football, hockey, broomball, etc.) Silkscreened, embroidered. Call Sport Olympia 683-2438.

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367 CARS FOR SALE

Mustang, 1981, must sell!! 4 speed with O/D, hatchback, AM/FM cassette; Asking \$800, call 345-1159 after 4 p.m.

370 LOST AND FOUND

Lost - small brown leather wallet, don't know where or when, but desperately need it back. \$50

reward: Call Stephen Nairne, 284-5484.

LOST: Last week at Gerts Pub, Gold Ring. Sentimental Value, Reward. Please phone Andrea at 522-0740.

374 - PERSONAL

Need Information? Feeling lonely? Just want to chat? Then call McGill Nightline! We are students talking to students. 398-6246, Monday to Friday, 9 p.m. to 3 a.m. Anonymous and confidential.

For: Information (where's the library?); Referral: (I want to change majors.); Someone to talk to (how's it going?). Call: McGill Nightline 398-6246; From: 9pm - 3am.

Male McGill student looking for weight training partner for safety and motivation. 3-4 times weekly. Call 277-6154 if you're serious about getting in shape this fall.

Thanksgiving Weekend. Two one way tickets to Vancouver. Departure Oct. 7, 1988. \$180 each, call: 487-4160 - leave message.

Male, unattached, 30, attractive, sensitive, humorous spontaneous. Enjoys romance music, dancing, funny movies, country walks. Like to meet interesting lady. Box 4253, Montreal, H3Z 3B6.

385 - NOTICES

ANIMAL RIGHTS! A new group called META - McGill for the Ethical Treatment of Animals is looking for members. Call Steve at 272-5064.

Weight loss support groups are being run this fall at McGill. No charge for participation. For information please call Carmen Mikhail at 398-6117 or 849-6807.

McGill Writers' Guild - A new group for student writers - For more information call 284-4421.

Have a problem your roommate can't solve? (Is your roommate the problem?) Call McGill Nightline, 398-6246. (We live for this sort of stuff)

American College Football. Pitt Panthers Versus Syracuse Orangemen at the carrier dome, Saturday December 3rd. Price: \$55. Reservations: Before Sept. 30th to Michel Paquette, 661-4584.

Auditions for "Cabaret" the musical, presented by James McGill productions, Sept. 22, 4-7:30; Sept. 23, 3-6; Sept. 24, 12:30-4:00. Newman Centre, 3484 Peel (Below Penfield). Information 939-9625.

Satire. Humour. Lampooning. Madness. The Red Herring is a new magazine on Campus devoted to the above. Come to our meeting tonight: 16:00-18:00; Union 425/426.

389 MUSICIANS WANTED

We need a kick-ass heavy dub funky drummer immediately. power stomping thrash and cool jazz a must. Challenges galore. Post-Alternative attitude also helpful. Records!! Tours!! Chris: 284-6058, leave message.

Rehearsal pianist needed for "CABARET" auditions. Must be excellent sight reader. Come get involved in James McGill Productions! For more information phone 939-9625.

392 PARKING SPACES

2 parking tickets = \$60. One month's rental of my outdoor, off campus parking, \$40.00. 470 Prince Arthur West, 9-12 a.m. Suit small cars.

WEST POINT STUDENT CONFERENCE ON UNITED STATES

Applications are invited for two delegates to attend the 40th West Point Conference dealing with "Continuity and Change in American Foreign Policy". The Conference will be held at West Point from November 16 - November 19, 1988. Preference will be given to U3 students with academic background in international politics, international economics and area studies. Applications may be obtained from:

Professor Michael Brecher
Department of Political Science
Leacock 528

Deadline: Monday, September 26.

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L'histoire des rayons N

Université de Nancy: mi-mars 1903. René Blondlot travaille dans un laboratoire de l'établissement. Il tente de déterminer si les rayons X sont composés d'ondes ou de particules.

M A R C N A N T E L

Pour ce faire, il suppose que les rayons X produits par un tube à décharge sont de nature ondulatoire. Une petite étincelle produite par un courant électrique circulant entre deux broches de métal très rapprochées augmentera d'éclat lorsque placée sur le parcours des rayons.

Il exécute l'expérience et en obtient un résultat positif mais s'aperçoit aussi qu'en faisant passer ces rayons X au travers d'une lame de mica, il peut réfracter et réfléchir les rayons. Il peut les suivre avec l'étincelle.

Il se dit que tout cela est très bien mais sait parfaitement que les rayons X ne se réfractent pas, ni ne se réfléchissent. Il conclut avoir affaire à une nouvelle sorte de rayon, une nouvelle espèce de lumière.

Blondlot présenta ses résultats à la séance hebdomadaire de l'Académie des sciences de Paris (dont il fait partie) du 23 mars 1903 sous le titre 'Sur une nouvelle espèce de lumière'.

Blondlot se mit alors à travailler d'arrache-pied sur 'ses' rayons—que l'on vint à appeler 'rayons N' pour l'Université de Nancy—et ils s'avèrent très polyvalents...

Il s'intéressa d'abord à l'étude des propriétés inhérentes aux rayons N. Il commença par trouver maintes sources de ces rayons. Le soleil, entre autres, émet une bonne quantité de rayons N.

Pour détecter les rayons N, Blondlot utilisait une petite étincelle telle que dessinée sur la Figure 1. Cependant, les détecteurs les plus polyvalents furent les substances phosphorescentes. L'effet est à peine visible mais cette méthode de détection sera la plus utilisée car on peut facilement fixer ces substances sur des instruments de mesures d'angles ou de distances.

Bientôt, Blondlot disposait d'un attirail complet de sources et de détecteurs de rayons N pour en étudier les interactions avec le milieu.

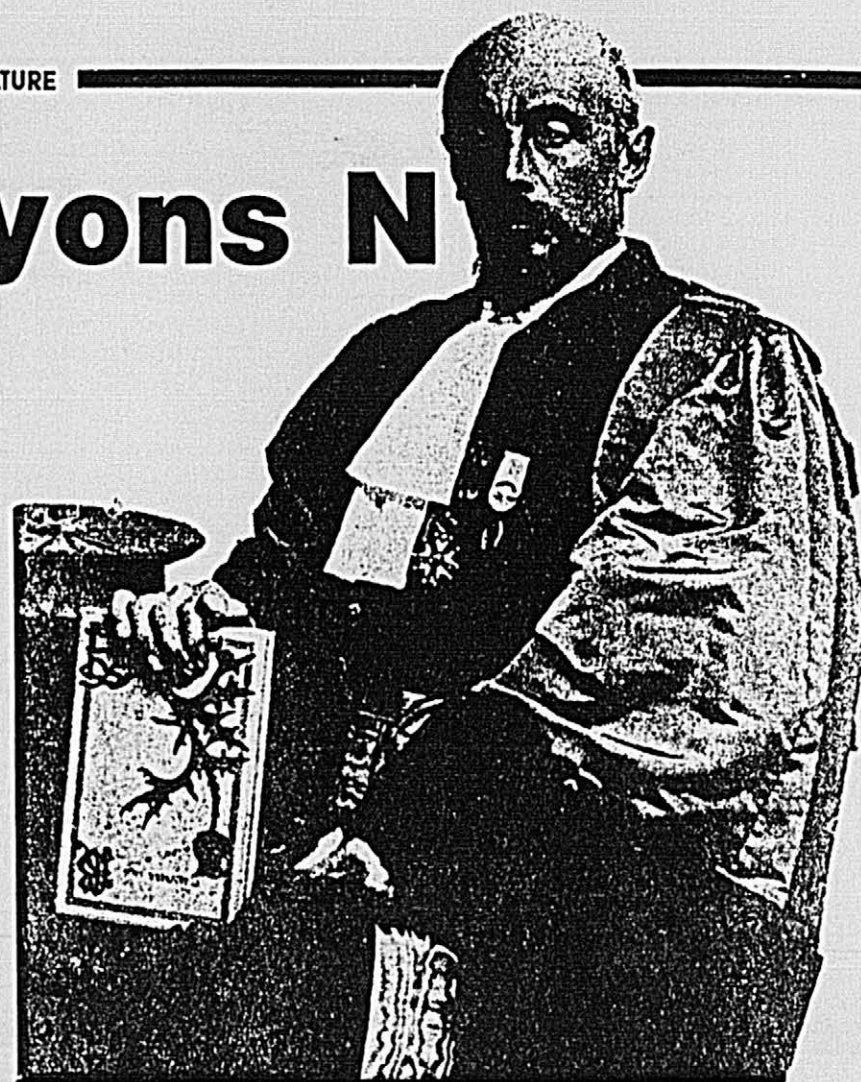
Tout d'abord, il s'aperçut que plusieurs matériaux opaques à la lumière visible ou à d'autres rayonnements étaient transparents aux rayons N: les métaux et le bois, leurs dérivés, et aussi les cristaux. L'eau et le sel ne laissent rien passer, le verre dépoli diffuse les rayons N.

C'est avec cette dernière propriété du verre dépoli que Blondlot manufacturera ses seules preuves tangibles 'enregistrables' de l'existence de ces rayons.

Blondlot ne pouvait pas obtenir de photographies de ses rayons car ils n'impressionnaient pas les émulsions d'argent. Ce qu'il photographia par contre ce sont les effets des rayons N sur une étincelle. La figure 3 donne un aperçu du mécanisme utilisé. Le bout de plaque photographique exposé avec l'aide des rayons N était plus impressionné que celui où l'étincelle agissait seule.

Blondlot n'était pas seul à poursuivre des recherches sur les rayons N. D'autres scientifiques très connus comme Henri et Jean Becquerel contribuèrent à la connaissance de ces radiations. Un secteur particulièrement actif fut la médecine. Un collègue de Blondlot à Nancy, Augustin Charpentier, décéla des émissions de rayons N en provenance des nerfs et des muscles des mammifères. On découvrit aussi à Nancy que les yeux devenaient plus sensibles lorsqu'exposés aux rayonnements N.

C'est l'apothéose dans l'univers de René Blondlot. Il reçoit en 1904 le prestigieux prix Leconte de l'Académie des sciences (accompagné d'une bourse de



50 000 francs). Cette même année, plus de cinquante articles traitant des rayons N furent publiés dans les comptes-rendus hebdomadaires de l'Académie seulement (alors que pendant ce temps on n'y publiait que trois articles sur les rayons X).

Les rayons N semblaient avoir pris leur place dans la physique du début du siècle. Comment se fait-il que nous n'en ayons jamais entendu parler en 1988?

N'existent pas!

Si, à Nancy, les résultats positifs confirmant l'existence des rayons N pleuvaient autant en physique, qu'en physiologie et en chimie, il n'en était pas de même pour le reste du monde scientifique. On ne pouvait reproduire les résultats de Blondlot et al. Ceci amenait à Nancy maint visiteurs pour voir de façon directe, sur place, les mystérieux rayons N. Parmi l'une de ces délégations se trouvait R.W. Wood.

Il était professeur de physique à l'université John Hopkins aux États-Unis. C'était un spécialiste de la spectroscopie réputé mondialement. Wood, comme bien d'autres chercheurs du temps (Lord Kelvin, Sir William Crookes, Heinrich Ruben...) ne pouvait absolument pas obtenir de rayons N. Il était aussi un chasseur de fraudes inébranlable et sentit quelque chose de bizarre dans cette affaire...

Wood et les autres chercheurs invités ce matin de 1904 se firent démontrer plusieurs expériences par Blondlot lui-même. Wood trouva que les expériences effectuées avec l'étincelle était bien trop imprécises due aux fluctuations intrinsèques intenses de celle-ci. Il les défie ouvertement.

Se pourrait-il que les rayons N n'existent que pour celui qui veut les voir? Une autosuggestion massive des scientifiques de l'Université de Nancy? Wood répondit catégoriquement à cette question lors de la démonstration suivante: la déviation et séparation des différentes « couleurs » du spectre des rayons N (Figure 4). Un faisceau de rayons N était décomposé en plusieurs couleurs et on les observait sur un arc de cercle peint de matériel phosphorescent. Wood demanda

que l'expérience se fasse dans le noir: pour mieux voir, dit-il.

C'est là qu'il joua le grand coup. Alors que le laboratoire était plongé dans le noir et que tout le monde fixait la ligne de peinture phosphorescente, il enleva le prisme! Et tous les acolytes de Blondlot continuaient de voir les quatre couleurs! Maintenant Wood était vraiment convaincu que ces rayons n'étaient un leurre.

Wood publia un compte-rendu de la visite dans l'édition de « Nature » du 29 septembre 1904. Il massacra littéralement les rayons N, leur réfutant toute évidence physique réelle. Il raconte en particulier le gag du prisme subtilisé et comme il le dit en ses mots:

« The removal of the prism... did not seem to interfere in any way with the location of the maxima and minima in the deviated (!) ray bundle. »

A partir de ce moment, tout dégénéra. On se mit à oublier les rayons N et à retrouver les projets d'avant, tout en tirant une bonne leçon de ce cours de psychologie scientifique on ne peut plus édifiant. En France, on s'acharna un peu à démentir l'Américain, puis le reste du monde.

En 1907, tout était fini: la carrière de René Blondlot et l'histoire publique des rayons N. Les rayons N n'existaient plus que pour Blondlot et il les emporta avec lui le jour de sa mort en 1930. Ils ne font plus partie maintenant de la physique moderne si ce n'est qu'à titre d'intéressant cas d'autosuggestion collective dû à un « vouloir trouver » trop fort.

Pour un cas plus récent de fausses découvertes, on note le cas des anticorps « infiniment diluables ». Un groupe de recherche français déclare que les anticorps affectant certains globules blancs du sang continuent de faire effet même s'ils sont dilués au point où les chances qu'il subsiste un anticorps sont négligeables. Les résultats publiés en juin dans *Nature* — avec réserves des éditeurs — ont été discrédités par la suite par une équipe d'enquêteurs de ladite revue (mais pas avant d'avoir été confirmés par six autres laboratoires!). Voir *Nature*, fin juin; *The Gazette*, 23 juillet 1988; *Scientific American* (science and the citizen), septembre 1988.

